Catalogue of American Amphibians and Reptiles.

Tilley, S.G. 2010. *Desmognathus abditus*.

Desmognathus abditus (Anderson and Tilley)
Cumberland Dusky Salamander

Desmognathus abditus Anderson and Tilley 2003: 107. Type-locality, “Staples Spring Branch, a small tributary of Daddy’s Creek, 36º 3.609’ N, 84º 47.674’ W, Cumberland County, Tennessee.” Holotype, Museum of Comparative Zoology (MCZ), Harvard University, A-135817, an adult male, collected by Jennifer A. Anderson and Stephen G. Tilley, 24 July 2000 (examined by author).
Desmognathus ochrophaeus: Conant and Collins 1991:411 (part, see **Comment**).

• CONTENT. No subspecies are recognized.

• DEFINITION. A small (30–35 mm SVL at sexual maturity), semi-terrestrial member of the genus *Desmognathus* that inhabits the margins of small streams and vertical rock surfaces behind cascades on the Cumberland Plateau of Tennessee. The tail is slightly higher than wide distal to its midpoint, but lacks any trace of a keel when unregenerated. The positions of paired larval spots are nearly always evident in the dorsal pattern. These spots contain reddish pigment in some specimens and are bordered laterally by patches of melanophores that form strongly undulating dorsolateral stripes. The first spot pair is posterior to the forelimb insertions, with 4–6 (mode = 5) anterior to the hindlimb insertions and 8–11 in total.

• DIAGNOSIS. *Desmognathus abditus* most closely resembles *D. ochrophaeus* and *D. ocoee* which replace it geographically to the north and south, respectively, in the Cumberland Plateau. *Desmognathus abditus* and *D. ochrophaeus* are fixed for alternative variants at 9 allozyme loci (adenylate kinase, E.C. 2.7.4.3; glyceraldehyde 3-phosphate dehydrogenase, E.C. 1.2.1.12; glucose dehydrogenase, E.C. 1.1.1.47; 3-hydroxybutyrate dehydrogenase, E.C. 1.1.1.30; isocitrate dehydrogenase 2, E.C. 1.1.1.42; L-lactate dehydrogenase 1, E.C. 1.1.1.27; malate dehydrogenase, oxaloacetate-decarboxylating; E.C. 1.1.1.38; “leucyl-glycyl-glycine peptidase”; and phosphogluconate dehydrogenase, E.C. 1.1.1.44). Most *D. ochrophaeus* individuals have relatively straight dorsolateral stripes and larval spots are indistinct or absent in adults of that species. *Desmognathus abditus* and Cumberland Plateau *D. ocoee* are fixed for alternative variants at 9 loci (fumarate hydratase, E.C. 4.2.1.2; glucose dehydrogenase, E.C. 1.1.1.47; 3-hydroxybutyrate dehydrogenase, E.C. 1.1.1.30; isocitrate dehydrogenase 1 and 2, E.C. 1.1.1.42; L-lactate dehydrogenase 1, E.C. 1.1.1.27; malate dehydrogenase, oxaloacetate-decarboxylating, E.C. 1.1.1.38; “leucyl-glycyl-glycine peptidase”; and phosphogluconate dehydrogenase, E.C. 1.1.1.44. *Desmognathus abditus* differs from Cumberland Plateau *D. ocoee* in having more prominent larval spots, especially in old adults. The dorsolateral stripes are undulating in both species, but tend to retain their prominence in adult *D. abditus* while fading and breaking up with age in *D. ocoee*. The tails of Cumberland Plateau *D. ocoee* bear low keels, especially distal to their midpoints, while those of *D. abditus* lack even traces of keels. This character and smaller adult body size distinguish *D. abditus* from sympatric *D. fuscus, D. monticola*, and *D. welteri*.



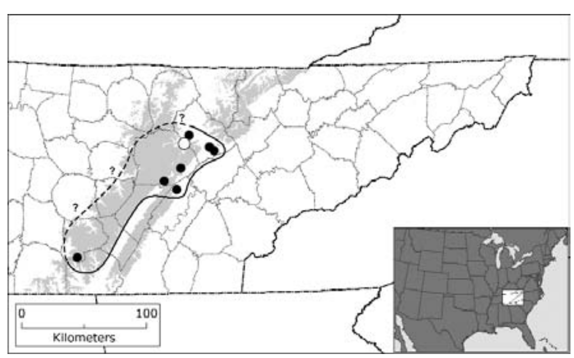
FIGURE 1. Adult male *Desmognathus abditus* (holotype, MCZ A-135817, photograph by the author).

• DESCRIPTIONS. Anderson and Tilley (2003) provided descriptions of the holotype and paratypes.

• ILLUSTRATIONS. Anderson and Tilley (2003) provided a black-and-white photograph of the type series.

• DISTRIBUTION. *Desmognathus abditus* is restricted to the Cumberland Plateau of Tennessee. The northernmost known locality is just south of the Cumberland Mountains section near Wartburg, Morgan County. The southern- and westernmost known locality is near Tracy City, Grundy County. The known localities range from 295–639 m above sea level.

• FOSSIL RECORD. None.



MAP. Distribution of *Desmognathus abditus*. The open circle denotes the type-locality. Dots indicate other records that have been confirmed by biochemical analysis. Shading indicates areas above 500 m. The dotted line and question marks indicate the uncertain range boundary.

• **PERTINENT LITERATURE.** Redmond and Scott (1996) provided locality records for salamanders that they treated as *Desmognathus ochrophaeus* in the Cumberland Plateau of Tennessee. These are *D. abditus* except those for Campbell and Scott counties (*D. ochrophaeus*) and a locality near Chattanooga (*D. ocoee*). The distribution of *D. abditus* is also included within the range shown for *D. ochrophaeus* in Conant and Collins (1991).

• **REMARKS.** Anderson and Tilley (2003) demonstrated that *Desmognathus abditus* is a distinct evolutionary unit that differs from populations of *D. ochrophaeus* to the north and *D. ocoee* to the south at several allozyme loci. They described *D. abditus* as a distinct species and provided information on its color pattern, morphology, distribution, and ecology. They showed that it and *D. ochrophaeus* hybridize where their ranges contact at Frozen Head, Morgan County, Tennessee, and provided evidence (linkage disequilibria, heterozygote deficiencies, and correlations between color patterns and allozyme genotypes) of restricted gene exchange between the two forms at this locality. They reported that populations on Walden Ridge in Rhea and Hamilton counties, Tennessee are polymorphic for *D. abditus* and *D. ocoee* allozyme variants at 4 of 9 diagnostic loci, but geographically discordant variation in allozyme frequencies suggests that appreciable gene flow no longer occurs between the two forms.

Lannoo (2005) summarized the information provided in the type description and emphasized the importance of protecting the habitat of this species, whose range is restricted to a region heavily exploited for coal and forest products.

• **ETYMOLOGY.** The name *abditus* is a Latin adjective meaning "hidden," "concealed," or "secret," in reference to both the species having remained undescribed until 2003 and the challenges of locating specimens and localities.

• **COMMENT.** Anderson and Tilley (2003) reported that the population of *D. ochrophaeus* from the Highland Rim cited by Miller (1991) is allozymically distinct from *D. abditus, D. ochrophaeus*, and *D. ocoee* and may represent an undescribed species. Other references to *Desmognathus ochrophaeus* populations within the range of *D. abditus* (e.g. Conant and Collins 1991; Redmond and Scott 1996) can be assumed to refer to the latter species.

LITERATURE CITED

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